IN THE CLAIMS:

1-26. **(Cancel).** Insert new claims 27 - 40.

27. **(New)** A method for the continuous, non-invasive measurement of blood pressure based on the principle of the unloaded arterial wall, where on at least one first and one second body part or body region, each containing an artery of identical or comparable size, there is positioned a first and a second pressure cuff of identical or comparable size with a first and a second inflatable pressure measuring chamber, the pressure in the first pressure measuring chamber being controlled in dependence of the measurement signal of a plethysmographic sensor device in such a way that the amplitude of the plethysmographic measurement signal is minimized, and a pressure measuring signal being obtained from the first pressure measurement chamber, wherein the second pressure measuring chamber is operated as a reference pressure chamber independently of the first pressure measuring chamber, and wherein the pressure in the reference pressure chamber is controlled in accordance with a preselectable pressure function, a reference signal being obtained simultaneously with the pressure measuring signal, and the reference signal is used in the interpretation of the pressure measuring signal.

28. **(New)** Method according to claim 27, wherein the setpoint of the pressure measuring signal is continuously monitored and/or adjusted by means of the reference signal.

29. **(New)** Method according to claim 27, wherein the reference signal is measured plethysmographically in the reference pressure chamber.

30. **(New)** Method according to claim 29, wherein the pressure in the reference pressure chamber is controlled in accordance with the preselectable pressure function and simultaneously with the help of the plethysmographically obtained reference signal in such a way that the amplitude of the reference signal is minimized while a reference pressure signal is measured, and wherein the reference pressure signal, measured at various pre-selectable pressure values of the pressure function, is analysed, compared to predetermined ideal pulse curves, and - when the deviation from a given pulse curve is at a minimum - the setpoint for the pressure measuring signal is determined therefrom.

31. **(New)** Method according to claim 27, wherein a physiological or pathological change of the pressure measuring signal is inferred from a change of the mean pressure and/or the amplitude of the pressure measuring signal and a shift of the amplitude maximum of the reference signal or the reference pressure signal in the same direction.

32. **(New)** Method according to claim 27, wherein a loss of setpoint of the pressure signal is inferred from a change of the mean pressure and/or the amplitude of the pressure measuring signal and an absent or oppositely directed shift of the amplitude maximum of the reference signal or the reference pressure signal.

33. **(New)** Method according to claim 27, wherein at preselectable time intervals or triggered by loss of setpoint the reference pressure chamber is operated as pressure measuring chamber and the pressure measuring chamber as reference pressure chamber.

34. **(New)** Method according to claim 27, wherein the two pressure cuffs are positioned on two neighbouring arteries, preferably on two adjacent fingers of one hand.

35. **(New)** A device for the continuous, non-invasive measurement of blood pressure based on the principle of the unloaded arterial wall, with at least one first and one second pressure cuff of identical or comparable size, which are attached on at least one first and one second body part or body region containing an artery of identical or comparable size, each pressure cuff having an inflatable pressure measuring chamber, the first pressure cuff being provided with a first plethysmographic sensor device connected to a controlling and adjusting device, which controls the pressure in the first pressure measuring chamber using the measuring signal of the plethysmographic sensor device, and where the pressure measuring chamber is connected to a pressure sensor to obtain a pressure measuring signal, wherein the pressure measuring chamber of the second pressure cuff is configured as a reference pressure chamber, which is controlled simultaneously with and independently of the pressure measuring chamber of the first pressure cuff, and wherein the pressure measuring chamber of the first

pressure cuff and the reference pressure chamber of the second pressure cuff each have separate inlet valves and outlet valves, with the pressure in the reference pressure chamber being controlled via the controlling and adjusting device in accordance with a preselectable pressure function.

36. **(New)** Device according to claim 35, wherein the second pressure cuff is provided with a second plethysmographic sensor device.

37. **(New)** Device according to claim 35, wherein the separate inlet and outlet valves of the pressure measuring chamber and the reference pressure chamber are placed in separate pressure control chambers, which are each connected by separate pressure lines to the pressure measuring chamber and the reference pressure chamber and via the inlet valves to a common pressure source.

38. **(New)** Device according of claim 35, wherein a heating unit is integrated in or appended to the two pressure cuffs, which heating unit is provided with at least one heating element, preferably a heating foil or a heating spiral.

39. **(New)** Device according to claim 35, wherein at least one sensor is provided at a location distal to the pressure measuring chamber and the reference pressure chamber for measuring a volume change of said body part.

40. **(New)** Device according to claim 39, wherein an impedance sensor, strain gauges and/or an additional plethysmographic sensor is positioned at the distal end of a finger.